AU9652454

(12) PATENT ABSTRACT (11) Document No. AU-A-52454/96
(19) AUSTRALIAN PATENT OFFICE

(54) Title
AN INSECT BARRIER

International Patent Classification(s)
(51)[6] E04B 001/72 A01M 001/20 E04H 009/16

(21) Application No. : 52454/96 (22) Application Date : 22.05.96

(30) Priority Data

(31) Number	(32) Date	(33) Country
PN3190	26.05.95	AU AUSTRALIA

(43) Publication Date : 05.12.96

(71) Applicant(s)
MICHAEL CHARLES MANN

(72) Inventor(s)
MICHAEL CHARLES MANN

(74) Attorney or Agent
WRAY & ASSOCIATES , PO Box 6292, Hay Street, EAST PERTH WA 6004

(57)

The present invention relates generally to a barrier (10) comprising a lower sheet (12) joined to an upper sheet (14) so as to form a plurality of spaces or cavities (16) therebetween. Each of the cavities (16) sealably contains a solution of heptachlor (18). The lower sheet (12) is designed to be pierced by a termite forming a hole in the lower sheet (12). Once a termite breaks the lower sheet (12), liquid heptachlor (18) flows from the hole and kills the termite. The heptachlor is also absorbed in the ground to leave a heptachlor residue effective in killing any other termites. In an alternate example of the present invention a chemical compound, such as heptachlor, is formed as granules and the granules are retained within a cavity of the barrier. In this example, a lower sheet is constructed of a mesh having a series of perforations through which a termite can pass. According to other aspects of the invention a barrier comprises a single sheet constructed of a material including a chemical compound which is effective in killing insects. The chemical compound may also be included in a layer formed on either or both surfaces of a sheet.

P/00/011
Regulation 3.2

AUSTRALIA

PATENTS ACT 1990

COMPLETE SPECIFICATION FOR A

STANDARD PATENT

Name of Applicant: MICHAEL CHARLES MANN

Address of Applicant: 26 NORTH STREET
COTTESLOE WA 6011

Actual Inventor: MICHAEL CHARLES MANN

Address for Service: Wray + Associates
PO Box 6292
East Perth WA 6892
~~Griffith Hack & Co.~~
256 Adelaide ~~Terrace~~ (6 Floor)
~~PERTH WA 6000~~

Standard Complete Specification for the invention entitled:

AN INSECT BARRIER

Details of Associated Provisional Applications:

Australian provisional patent application No. PN3190 filed on 26 May 1995

The following is a full description of this invention, including the best method of performing it known to me:-

AN INSECT BARRIER

The present invention relates generally to a barrier for insects of the Isoptera order and relates particularly, though not exclusively, to a termite barrier to be placed under a concrete slab of a building such as a house.

A common house construction technique, involves pouring a concrete slab over a levelled and compacted sand pad where the house is to be located. The concrete slab is poured over concrete footings which are designed to take the weight of external or internal walls. A plastic sheet is layed between the sand pad and concrete slab to prevent moisture from the ground entering the house.

In an attempt to prevent termites from entering a house through the slab the ground or levelled sand pad is sprayed with a chemical prior to laying the plastic sheet and pouring the concrete slab. The chemical is an organic liquid such as heptachlor which is known to be damaging to the environment. Heptachlor is diluted using water to achieve a desired concentration and the diluted heptachlor is then sprayed over the sand pad.

Heptachlor is a toxic chemical and thus breathing apparatus and suitable attire must be worn when preparing and then applying the heptachlor. Particularly in windy conditions, a large percentage of the heptachlor may not be absorbed into the sand pad and is thus exposed to the surrounding atmosphere. Chlorine contained within the heptachlor is particularly volatile and is known to destroy ozone within the ozone layer which is believed to adversely affect the environment. Furthermore, there are fears that heptachlor and other compounds used for the same purpose may be carcinogenic. As a result of at least the above problems the use of halogen containing compounds used to control termites, and in particular their methods for application,

are gradually being phased out. For example, in the State of Western Australia the spraying of heptachlor to control termites will no longer be allowed after 30 June 1995.

The spraying of chemicals such as heptachlor to effectively control termites has been questioned by an increasing number of builders. Some pest control companies state on their guarantees that if after heptachlor has been applied the sand pad is disturbed, the heptachlor is no longer guaranteed to prevent termites entering a house. A granite worker, who typically pours the concrete slab and footings, by walking on the sprayed sand pad may thus disturb the heptachlor. When the granite worker places plastic over the sand pad, which will prevent moisture from the ground entering the house, he must inevitably walk on the pad, once again disturbing the heptachlor. Furthermore, the application of heptachlor to the sand pad is rarely checked and insufficient heptachlor, or heptachlor of an inadequate concentration, may be applied to the pad. With pest controllers of poor integrity there is the possibility that the sand pad may not be sprayed at all.

Australian patent no. 639256 describes a stainless steel mesh, marketed and sold in Australia under the trade mark TERMIMESH, which is located between the concrete slab and the sand pad. Pores of TERMIMESH are sized so that a termite cannot pass therethrough and the house is thus protected against termites. Where pipes pass through the concrete slab the TERMIMESH is cut and formed as a flange around the pipe and then clamped onto the pipe. However, TERMIMESH is generally difficult to cut and form. Furthermore, TERMIMESH is significantly more expensive compared to spraying the sand pad with a chemical substance such as heptachlor.

An intention of the present invention is to provide a barrier for insects of the Isoptera order that is

relatively inexpensive, is relatively safe to handle and lay, and is relatively effective in use.

According to a first aspect of the present invention there is provided a barrier for an insect of the Isoptera order comprising:

a sheet being constructed of a material which is penetrable to said insect;

an opposing sheet connected to said penetrable sheet thereby defining at least one space therebetween; and

a chemical compound which is effective in killing said insect being retained within said at least one space whereby, in use, the barrier can be located adjacent a structure to be protected from attack by said insect so that when said insect penetrates the sheet and/or enters said at least one space the insect is exposed to and killed by the chemical compound.

Typically, said chemical compound is in a substantially liquid form at ambient temperature and the sheet and the opposing sheet are substantially impervious to said liquid compound which is sealably contained within said at least one space so that, in use, when an insect pierces the sheet a volume of said liquid compound is absorbed in the ground leaving a residue of said compound which thereafter is effective in killing any further insects.

Alternatively, the chemical compound is in a substantially solid form at ambient temperature, at least a portion of the sheet being a mesh or perforated sheet designed to retain said solid compound within said at least one space and be freely-penetratable by an insect whereby, in use, said insect can pass across the mesh or perforated portion of the sheet and excrete a substance which at least partly dissolves the chemical compound so that said dissolved compound and/or undissolved compound can kill said insect and pass through the mesh or perforated portion to be

absorbed in the ground and leave a residue which is effective in killing other insects.

Advantageously, the sheet and the opposing sheet are connected to form a plurality of spaces, adjacent spaces separated by a connecting portion which, in use, can be cut and the chemical compound still retained within each of said plurality of spaces.

According to a second aspect of the present invention there is provided a barrier for an insect of the Isoptera order comprising:

a sheet constructed of a material including a chemical compound which is effective in killing said insect, the chemical compound being embedded in the sheet so that, in use, the barrier being substantially non-toxic when handled can be located between the ground and a structure to be protected from said insect, so that when said insect pierces a surface of the sheet said insect is exposed to and killed by said chemical compound.

According to a third aspect of the present invention there is provided a barrier for an insect of the Isoptera order comprising:

a layer including a chemical compound which is effective in killing said insect, said layer being formed on at least one surface of a sheet so that, in use, the barrier being substantially non-toxic when handled can be located between the ground and a structure to be protected so that when said insect pierces either an opposing surface of the sheet or contacts an exposed surface of the layer said insect is exposed to and killed by said chemical compound.

In one example the sheet or the layer of the barrier are formed as part of an adhesive tape.

Advantageously, said sheet and/or said opposing sheet are substantially impervious to moisture within the ground so that, in use, the barrier also substantially prevents the passage of moisture from the ground to the structure to be protected from said insects.

In one embodiment said sheet and/or said opposing sheet are at least partly constructed of a plastics material such as a polyvinyl chloride (PVC) based material or a derivative thereof. Advantageously, the sheet and opposing sheet can be thermo-welded together to form said at least one space.

Typically, said chemical compound comprises an organic liquid containing a halogen element, such as chlorine. In one such example the chemical compound is heptachlor or a derivative thereof. Alternatively the chemical is DILDRIN, CHLORDANE, ALDRIL, or a derivative thereof.

Insects of the Isoptera order include termites or white-ants.

In order to achieve a better understanding of the nature of the present invention preferred embodiments of a barrier for insects of the Isoptera order will now be described in some detail, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of an insect barrier; and

Figure 2 is an exploded cross-sectional view of a portion of the insect barrier shown in Figure 1.

As shown in figure 1 there is a barrier shown generally as 10 comprising a lower sheet 12 joined to an upper sheet 14 so as to form a plurality of spaces or cavities 16 therebetween. Each of the cavities 16 sealably contains a solution of heptachlor 18 (see figure 2).

In this example, the lower and upper sheets 12, 14 are both constructed of a polyvinyl chloride (PVC) material. Each of the cavities 16 is formed by thermo-welding a portion of opposing surfaces of the lower and upper sheets 12, 14 together. A connecting portion 20 is thus formed between adjacent cavities 16. The lower and upper sheets 12, 14 are welded together so that a plurality of substantially square-shaped cavities 16 are formed. The heptachlor solution 18 is sealed within each of the cavities 16. The concentration of heptachlor 18 in each cavity 16 is determined by experimentation having regard to the particular insect to be killed. In this example, where the barrier 10 is used for termites, the concentration of heptachlor 18 in each cavity 16 is to be effective in killing termites.

Where the lower and upper sheets 12, 14 are constructed of PVC the barrier 10 can be rolled onto a spool for convenient transportation and handling. The barrier 10 can then be unrolled from the spool across the ground, adjacent a structure to be protected. Most typically, the barrier 10 is placed over a sand pad 22 prior to pouring a concrete slab 24 over which a house is constructed. The barrier 10 can be cut to the required length and shape without exposing heptachlor 18 to the atmosphere by cutting along the connecting portion 20 of the barrier 10.

The barrier 10 constructed of lower and upper PVC sheets 12, 14 is substantially impervious to moisture and thus prevents the passage of moisture from the sand pad 22 to the house via the concrete slab 24. Pipes or conduits (not shown) projecting through the concrete slab 24 are passed through a hole cut in both the lower and upper sheets 12, 14. Heptachlor 18 contained within a cavity 16 which may be cut leaks from the cavity 16 and is absorbed into the ground adjacent the pipe or conduit. A heptachlor residue in the ground is effective in killing any termites

attempting to burrow through the concrete slab 24 in the vicinity of the pipe or conduit. The concentration and volume of heptachlor 18 contained within each cavity 16 is determined so that the heptachlor 18 released when the barrier 10 is cut is relatively safe when exposed to the atmosphere as the heptachlor 18 is absorbed into the ground.

In this example, the upper PVC sheet 14 is relatively thick and designed to withstand a relatively large amount of deformation without tearing or breaking, and unnecessarily exposing heptachlor 18 to the atmosphere. Thus, when the barrier 10 is initially laid on the sand pad 22 the upper PVC layer 14 can be walked upon without a great risk of piercing or breaking the upper PVC sheet 14. The lower PVC sheet 12 is constructed of a somewhat thinner material designed to be pierced by a termite, in this example, by forming a hole in the lower PVC sheet 12. The hole may be formed by the termite consuming or damaging a portion of the lower PVC sheet 12 and/or excreting a substance which at least partly dissolves the lower PVC sheet 12. It is believed that the excreted substance includes acids such as formic acid. Once a termite breaks through the lower PVC sheet 12, liquid heptachlor 18 flows from the hole formed and kills the termite. The heptachlor 18 is also absorbed in the sand pad 22 to leave a heptachlor residue in the vicinity of the hole. The residue of heptachlor absorbed in the sand pad 22 is thereafter effective in killing any other termites attempting to enter the house via the concrete slab 24. The volume and concentration of heptachlor 18 is predetermined so that it kills the termite and also leaves a heptachlor residue absorbed in the sand pad 22 effective in killing any further termites.

In an alternative example of the present invention a chemical compound, such as heptachlor, is formed as granules, the granules being retained within a cavity of

the barrier (not shown). In this example, a lower sheet is constructed of a mesh having a series of perforations through which a termite can pass. The termite will then either consume the heptachlor granule or excrete a substance which dissolves a portion of the heptachlor, so that the dissolved heptachlor can pass through the mesh and be absorbed into a sand pad adjacent the barrier. The dissolved heptachlor absorbed in the sand pad is thereafter effective in killing any further termites passing through this area of the pad. Alternatively, the heptachlor granules are gradually dissolved by moisture within the sand pad so that a residue of heptachlor is absorbed by the pad and thereafter acts as a termite barrier.

According to another aspect of the invention not illustrated a barrier comprises a single sheet constructed of a material including a chemical compound which is effective in killing insects of the Isoptera order such as a termite. The sheet is formed so that the chemical compound, such as heptachlor, is embedded or chemically bonded therewith. The heptachlor is exposed to the termite only once a surface of the sheet is broken. The heptachlor concentration is then sufficient to kill the termite. Advantageously, the barrier is substantially non-toxic when handled and thus relatively safe. Heptachlor in this example is in a substantially solid form. When the solid heptachlor is exposed to a substance excreted from a termite, as the termite burrows through the barrier, the heptachlor may at least partly dissolve and thereafter leach into an underlying sand pad. The heptachlor residue leached into the sand pad thus provides a barrier to prevent any further termites entering the house.

According to yet another aspect of the present invention not illustrated a barrier for insects of the Isoptera order comprises a layer including a chemical compound, such as heptachlor, effective in killing termites. The chemical

layer is formed on either one or both surfaces of a sheet. The sheet, in this example, is constructed of PVC and acts as a support for the chemical layer. The chemical layer is substantially non-toxic except when its surface is broken, and thus the barrier can be handled and laid without exposing, in this example, the heptachlor. The barrier is located under a house to be protected, with the chemical layer contacting the sand pad. In use, a termite breaks the chemical layer and is thus exposed to and killed by the heptachlor included within the layer. The layer may be formed as part of an adhesive tape, the tape being adhered to various objects such as pipes through which or alongside which termites may pass.

Now that several preferred embodiments of the present invention have been described in some detail it will be apparent to those skilled in the relevant arts that a barrier for insects of the Isoptera order has at least the following advantages over the admitted prior art:

(i) the chemical compound being effective in killing the insects is not exposed to the atmosphere at excessive levels when compared to the spraying of substances such as heptachlor;

(ii) the barrier is relatively inexpensive compared to barriers such as TERMIMESH;

(iii) the barrier is particularly effective around pipes and conduits projecting through a concrete slab as the chemical compound retained within a space or cavity defined in the barrier is released and absorbed in the ground adjacent the pipe or conduit; and

(iv) the barrier is effective in killing selected insects of the Isoptera order depending on the chemical compound chosen and the concentration and/or volume used.

It will be apparent to persons skilled in the relevant arts that numerous modifications and variations can be made to the barrier in addition to those described above without departing from the basic inventive concepts and the spirit of the present invention. The chemical compound included in the barrier may be any compound which is effective in killing an insect of the Isoptera order. In the example of a termite, the chemical compound may be DILDRIN, CHLORDANE, ALDRIL, or any derivative thereof. The barrier is not restricted to preventing the passage of termites but may include any other insect of the Isoptera order. The barrier is not restricted to having spaces of the configuration described but may include practically any other shaped space. The barrier is not restricted to protecting a house as described herein but also includes protection of, for example, electrical cable from damage by termites. Finally, the invention is also intended to extend to the blending of a chemical compound, which is effective in killing an insect, with a polymeric material, such as a foamed polystyrene material. In one such example, the chemical compound and foamed material may be contained in and dispensed from an aerosol container. All such variations and modifications are to be considered within the scope of the present invention the nature of which is to be determined from the foregoing description.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A barrier for an insect of the Isoptera order comprising:

a sheet being constructed of a material which is penetrable to said insect;

an opposing sheet connected to said penetrable sheet thereby defining at least one space therebetween; and

a chemical compound which is effective in killing said insect being retained within said at least one space whereby, in use, the barrier can be located adjacent a structure to be protected from attack by said insect so that when said insect penetrates the sheet and/or enters said at least one space the insect is exposed to and killed by the chemical compound.

2. A barrier as defined in claim 1 wherein said chemical compound is in a substantially liquid form at ambient temperature and the sheet and the opposing sheet are substantially impervious to said liquid compound which is sealably contained within said at least one space so that, in use, when an insect pierces the sheet a volume of said liquid compound is absorbed in the ground leaving a residue of said compound which thereafter is effective in killing any further insects.

3. A barrier as defined in claim 1 wherein the chemical compound is in a substantially solid form at ambient temperature, at least a portion of the sheet being a mesh or perforated sheet designed to retain said solid compound within said at least one space and be freely-penetratable by an insect whereby, in use, said insect can pass across the mesh or perforated portion of the sheet and excrete a substance which at least partly dissolves the chemical compound so that said dissolved compound and/or undissolved compound can kill said insect and pass through the mesh or perforated portion to be absorbed in the ground

and leave a residue which is effective in killing other insects.

4. A barrier as defined in any one of the preceding claims wherein the sheet and the opposing sheet are connected to form a plurality of spaces, adjacent spaces separated by a connecting portion which, in use, can be cut and the chemical compound still retained within each of said plurality of spaces.

5. A barrier for an insect of the Isoptera order comprising:

a sheet constructed of a material including a chemical compound which is effective in killing said insect, the chemical compound being embedded in the sheet so that, in use, the barrier being substantially non-toxic when handled can be located between the ground and a structure to be protected from said insect, so that when said insect pierces a surface of the sheet said insect is exposed to and killed by said chemical compound.

6. A barrier for an insect of the Isoptera order comprising:

a layer including a chemical compound which is effective in killing said insect, said layer being formed on at least one surface of a sheet so that, in use, the barrier being substantially non-toxic when handled can be located between the ground and a structure to be protected so that when said insect pierces either an opposing surface of the sheet or contacts an exposed surface of the layer said insect is exposed to and killed by said chemical compound.

7. A barrier as defined in either claim 5 or 6 wherein the sheet or the layer of the barrier are formed as part of an adhesive tape.

8. A barrier as defined in any one of the preceding claims wherein said sheet or said opposing sheet are substantially impervious to moisture within the ground so that, in use, the barrier also substantially prevents the passage of moisture from the ground to the structure to be protected from said insects.

9. A barrier as defined in any one of the preceding claims wherein said sheet or said opposing sheet are at least partly constructed of a plastics material.

10. A barrier as defined in any one of the preceding claims wherein said chemical compound comprises an organic liquid containing a halogen element.

11. A barrier for an insect of the Isoptera order said barrier being constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.

DATED THIS 25TH DAY OF MAY 1996

MICHAEL CHARLES MANN

By His Patent Attorneys:

~~GRIFFITH HACK & CO.~~ Wray & Associates

~~Fellows Institute of Patent Attorneys of Australia~~

ABSTRACT

The present invention relates generally to a barrier (10) comprising a lower sheet (12) joined to an upper sheet (14) so as to form a plurality of spaces or cavities (16) therebetween. Each of the cavities (16) sealably contains a solution of heptachlor (18). The lower sheet (12) is designed to be pierced by a termite forming a hole in the lower sheet (12). Once a termite breaks the lower sheet (12), liquid heptachlor (18) flows from the hole and kills the termite. The heptachlor is also absorbed in the ground to leave a heptachlor residue effective in killing any other termites. In an alternate example of the present invention a chemical compound, such as heptachlor, is formed as granules and the granules are retained within a cavity of the barrier. In this example, a lower sheet is constructed of a mesh having a series of perforations through which a termite can pass. According to other aspects of the invention a barrier comprises a single sheet constructed of a material including a chemical compound which is effective in killing insects. The chemical compound may also be included in a layer formed on either or both surfaces of a sheet.

52454/96

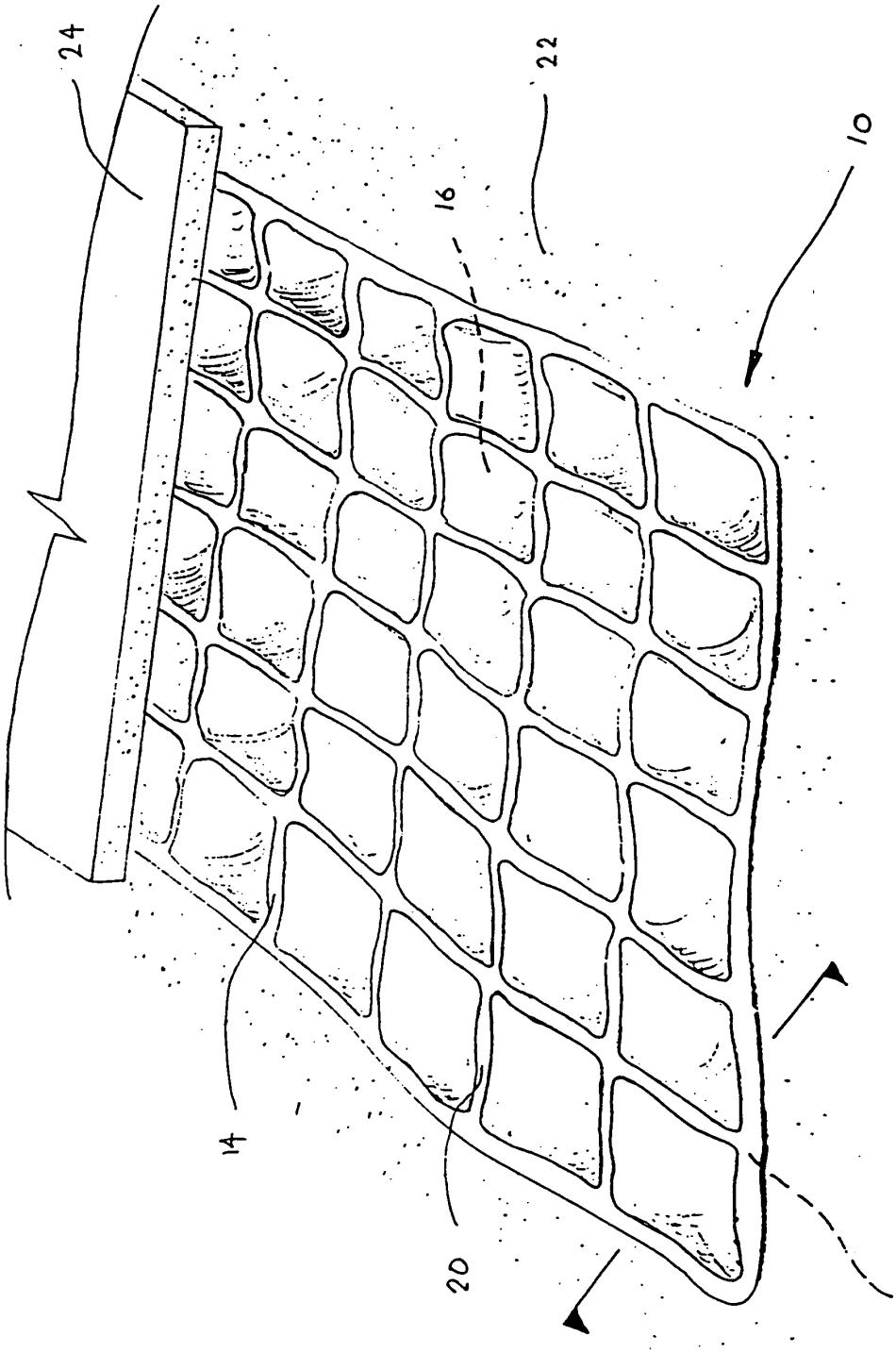

FIG. 1

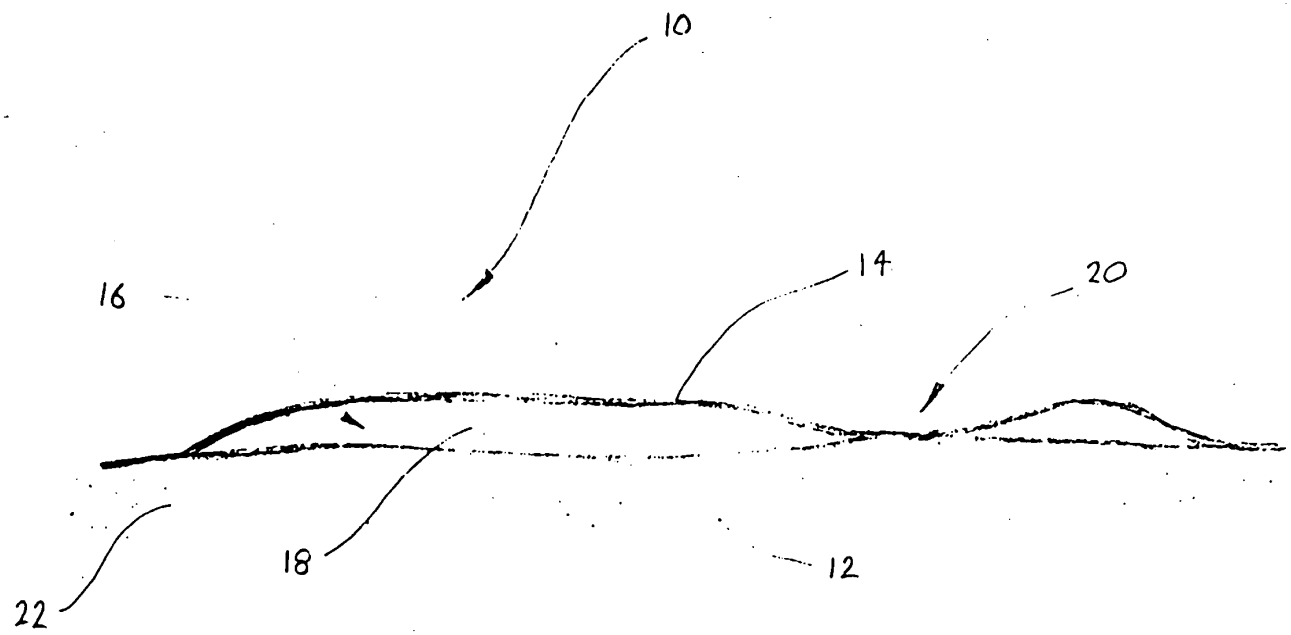

FIG. 2

P/00/001
Section 29

AUSTRALIA
Patents Act 1990

PATENT REQUEST: STANDARD PATENT
and
NOTICE OF ENTITLEMENT

I, MICHAEL CHARLES MANN, being the person(s) identified below as the Applicant and Nominated Person request the grant of a patent for an invention described in the accompanying standard complete specification.
Full application details follow.

[71] Applicant: MICHAEL CHARLES MANN
Address: 26 NORTH STREET
COTTESLOE WA 6011

[70] Nominated Person: MICHAEL CHARLES MANN
Address: 26 NORTH STREET
COTTESLOE WA 6011

[54] Invention Title: **AN INSECT BARRIER**

[72] Name(s) of actual inventor(s):
MICHAEL CHARLES MANN

[74] Address for service in Australia:
~~GRIFFITH HACK & CO., Patent and Trade Mark Attorneys, 256 Adelaide Tce, Perth 6000, Western Australia, AUSTRALIA.~~ Attorney Code: ~~HP~~ WR
Wray + Associates PO Box 6292 East Perth WA 6892

ASSOCIATED PROVISIONAL APPLICATION(S) DETAILS
[60] Application Number(s) and Date(s)

Australian provisional patent application No. PN3190 filed on 26 May 1995

AUSTRALIAN PATENT OFFICE REG 22.10 (2)

I, MICHAEL CHARLES MANN
of 26 NORTH STREET
COTTESLOE WA 6011

ADDRESS FOR SERVICE ALTERED

being the applicant in respect of this Application state the following:-

Part 1 - Must be completed for all applications.

The person(s) nominated for the grant of the patent:

is the actual inventor(s).

Part 2 - Must be completed if the application is Associated with one or more provisional applications.

The person(s) nominated for the grant of the patent is:
the applicant(s) of the provisional application(s) listed on the patent request form.

Drawing number recommended to accompany the abstract Figure 2

Dated this 22nd day of May 1996.

MICHAEL CHARLES MANN

GRIFFITH HACK & CO.

Patent Attorneys for and
on behalf of the Applicant